MT. CARMEL PUBLIC UTILITY CO.

ELECTRIC TRANSMISSION AND DISTRIBUTION REVIEW

ANNUAL REPORTING PERIOD -
2021

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PART 411.120(b)(3) ANNUAL REPORT

Subsection (b)(3)(A): A plan for future investment and, where necessary, reliability improvements for the jurisdictional entity's transmission and distribution facilities that will ensure continued reliable delivery of energy to customers and provide the delivery reliability needed for fair and open competition, along with the estimated cost of implementing the plan and any changes to the plan from the previous annual report.

i) The Plan must cover all operating areas, including a description of the relevant characteristics of each operating area and the age and current condition of the jurisdictional entity's equipment and facilities in each operating area.

Mt. Carmel Public Utility Co. maintains only one operating area. This territory covers approx. 107 square miles, one incorporated municipality and approx. 5,300 electric customers. Within the operating area there are approximately 19.16 line miles of transmission facilities, approximately 38.16 line miles of 69Kv Source of Supply facilities, 4.91 line miles of 69kv distribution facilities 255.21 line miles of 7200Kv overhead distribution facilities and approximately 10.07 line miles of 7200Kv underground distribution facilities, with approx. 27.21% of this total being urban distribution facilities. Five distribution substations with a total of fifteen distribution feeders, and two industrial\wholesale substations.

The information regarding the age and current condition of Mt. Carmel Public Utility Co. facilities is addressed in the response to subsection (b)(3)(G)(i).

Table 1: Budgeted Capital and Operations and Maintenance, O&M, amounts for the next three years.

CATEGORY	YEAR			
	2022	2023	2024	2025
Transmission – Capital	$81,000	$85,860	$91,012	$96,472
Transmission – O&M	$67,412	$69,434	$71,517	$73,663
Distribution\Source of Supply - Capital	$52,800	$55,968	$59,326	$62,886
Distribution – Capital	$901,000	$900,500	$954,530	$1,011,802
Distribution O&M	$1,907,941	$1,965,179	$2,024,134	$2,084,858
Total	$3,010,153	$3,076,941	$3,200,519	$3,329,681

The estimated cost of transmission supplied to Mt. Carmel by others is not included in the values for Transmission Operations and Maintenance listed above.

The estimated Transmission Capital values for 2022 thru 2024 reflect the proposed continuation of previously outlined pole replacements withing MCPU's transmission infrastructure.

The Distribution\Source of Supply Capital estimates for 2022 thru 2024 in the table above represent the estimated values associated with pole replacements in those years.

Based on the Uniform System of Accounts, Distribution\Source of Supply O&M values are incorporated into the O&M values for Distribution in the table above.

The Distribution Capital budget amounts for 2022 and 2023 represent the estimated values associated with the completion of projects outlined in this report for those years. The 2024 and 2025 values represent an estimated investment in continued distribution pole replacements in those years.

ii) Proposed Reliability Improvements,

Distribution Facilities:

Circuit 21000 – (Froman Drive Feeder) Circuit inspections have indicated that several pole structures in Line Section F-010N-130W-002-006, between Friendsville Ave and E 1000 Rd., are in need of replacement due to age. Mt. Carmel has determined that the best course of action is to replace all of the structures in this line section due to access issues and upgrade the line conductor from the current aged #6 CU to #2 ACSR. Currently Mt. Carmel proposes the completion date for this work to be late 2022. UPDATE: Mt. Carmel completed this project in late April at an estimated expenditure of $104,936.33

Recent inspections have indicated that the pole structure located at the intersection of College Drive and Oak Street is in need of replacement due to age and condition. This structure carries the major trunk line of Circuit #21000 and has multiple foreign utility contacts as well. Mt. Carmel has determined that replacing the current wooden pole structure with a manufactured unit will ensure that this key infrastructure point will be structurally

sufficient to support the current attached assemblies. The estimated completion date for this project is summer of 2022 at an estimated expenditure of $31,000.

Recent circuit inspections have identified several poles in LS F-010S-120W-020-192 which are in need of replacement due to age or condition. MCPU has determined that there is a need to rebuild and reconductor that portion of this LS which is multi-phase construction. This will impact approximately 0.32 line miles, or 51%, of the line sections coverage area and approximately 58% of the customers served by these facilities. MCPU proposes to complete this project by the fall of 2023.

Circuit 22000 - (Allendale Feeder) Recent circuit inspections have identified the need to replace several pole Structures in Line Section F-010N-120W-016-006. A further review of these facilities has identified the need to reconductor approximately 4,000 feet of three phase primary from #6 Cu to 1/0 ACSR conductor to accommodate the growing service requirements at two farming locations supplied by these facilities. Mt. Carmel proposes to complete the rebuild and upgrade of these facilities by the summer of 2022.

Circuit 41000 – (Rural West 3Rd Feeder) 2021 circuit inspections of this circuit by Staff, and scheduled inspections by MCPU in that year, have revealed several defects in Line Section F-010S-120W-030-008. Mt. Carmel proposes to rebuild and upgrade approximately 1.95 line miles of the existing #6 CU Conductor to #2 ACSR. Between the origination point of this line section at N 1120 Blvd and N 950 Blvd. Mt. Carmel estimates the completion date for this project to be the fall of 2022 at an estimated expenditure of $183,000.
UPDATE: Mt. Carmel completed this project in late March 2022.

Circuit 41000 – (Rural West 3Rd Feeder) In 2023 Mt. Carmel proposes to rebuild and reconductor approximately 2.17 line miles of Line Section R-010S-130W-035-003 from aged NO. 6 CU to 1/0 ACSR conductor. This project would impact approximately ninety-nine customers in and around the Sugar Creek Subdivision.

Mt. Carmel proposes no other reliability improvements past 2023 but rather intends to place a dedicated focus on its distribution system pole replacement and maintenance programs in those years.

iii) The plan shall identify all foreseeable reliability challenges and describe specific projects for addressing each.

Reliability challenges have been identified in the following areas:

Tree Related Interruptions – Mt. Carmel Public Utility Co. recognizes the impact that tree contact has on service reliability. Efforts to minimize interruptions due to tree contact include the installation of underground facilities, where feasible, the study and analyses of areas that pose accessibility conflicts to address these areas as appropriate. MCPU strives to maintain a three year cycle for distribution trimming. Where it is agreeable with the property owner trees are removed completely in an effort to eliminate potential future contact.

Animal Related Interruptions – See "Animal Related" under subsection (b)(3)(A)(vii) below

Circuits With High Occurrences of Interruptions – Distribution circuits which have experienced high numbers of outages are studied, and where applicable, sectionalizing devices are added, line reclosers are relocated or added, and, where feasible, portions are switched to another distribution circuit, or portions which pose accessibility issues are rebuilt or relocated as applicable. In addition expenditures listed in the table in response to subsection (b)(3)(A)(ii) above, under Distribution Operations and Maintenance, allow for pole and crossarm repair or replacement, insulator replacement, and arrestor replacement or installation as may be necessary to improve circuit reliability.

Facility Accessibility – In areas where access to distribution facilities is limited studies are conducted to determine the feasibility of facility rebuild or relocation.

iv) The plan shall provide a timetable for the achievement of the plans goals.

A schedule for completion of those items listed in sections ii and iii above is indicated for those issues that are not ongoing.

v) The plan shall report and address all unresolved reliability complaints about the jurisdictional entity's system received from other utilities, independent system operators, or alternative retail electric suppliers.

Mt. Carmel Public Utility Co. has received no reliability complaints from other utilities, independent system operators, or alternative retail electric suppliers.

vi) The plan shall report the specific actions, if any, the jurisdictional entity is taking to address the concerns raised in complaints received from other utilities, independent system operators, or alternate retail electric suppliers.

No actions are required.

vii) The plan shall consider all interruption causes listed in subsection (b)(3)(D)

Animal Related – Animal guards are installed at new transformer installations and on existing facilities as animal related problems are encountered.

Tree Related – This issue is covered in subsection(b)(3)(A),iii above.

Weather Related – Lightning arrestors are replaced as damaged equipment is encountered. Mt. Carmel continues to install additional lightning arrestors throughout its system in an effort to further minimize interruptions caused by lightning strikes.

Intentional\Maintenance Related – Outages that are scheduled for the purposes of maintenance or intentionally initiated in an effort to make service restoration work as safe as possible are kept to as minimal a duration as possible. Efforts are made to notify customers who may be impacted by the outage as to the estimated duration.
For all other interruption causes listed in subsection (b)(3)(D), Mt. Carmel believes that the "General System Wide Improvements" and "Circuit Specific Improvements" listed in subsection (b)(3)(A)(ii) above combined with the items outlined in subsection (b)(3)(B) and subsection (b)(3)(J) below address these remaining issues.

viii) The plan must consider the effects on customers and the cost of reducing the number of interruptions reported as required by subsection (b)(3)(C).

Table 2: The following chart depicts the effects of interruptions, by cause category, on Mt. Carmel customers during the 2021 reporting period.

CATEGORY	NUMBER OF EVENTS	SERVICE INTERRUPTIONS	TOTAL DURATION (MINUTES)
Animal Related	26	1,081	55,451
Vegetation Related	53	1,254	101,831
Employee\Contractor Personnel Errors	0	0	0
Underground Equipment Related	1	1	584
Transmission Equipment	0	0	0
Substation Equipment	0	0	0
Weather	37	1,373	74,824
Intentional\Maintenance	30	2,143	380,763
Other Alternative Supplier\Utility	0	0	0
Customer Equipment	35	35	1,989
Public	7	246	34,107
Overhead Equipment	27	2,964	193,663
Unknown	25	186	9,973
Other	0	0	0
Overload	1	1	50

The budgeted values provided in subsection (b)(3)(A)(ii) above under Distribution Operations and Maintenance allow for tree trimming operations, installation of animal protection, adding sectionalizing devices, pole and crossarm replacement or repair, insulator replacement, and arrestor replacement or installation as may be necessary to improve circuit reliability. Cost estimates, where available, are provided for circuit specific projects as outlined in subsection (b)(3)(A)(ii) above and subsection (b)(3)(B) and subsection (b)(3)(J) below.

Subsection (b)(3)(B): A report of the jurisdictional entity's implementation of this plan filed pursuant to subsection (b)(3)(A) of this Section for the previous annual reporting period, including an identification of significant deviations from the first year of the previous plan and the reasons for the deviations.

Information regarding the implementation of the previous year's plan and any significant deviations from this plan is listed below.

Table 3: The following table represents estimated and actual expenditures for 2021.

Category	Budget Estimate – 2021	Actual Expenditures – 2021
Capital (Transmission and Distribution)	$826,532	$1,701,911
O&M (Transmission and Distribution)	$1,957,738	$1,861,544
Total	$2,784,270	$3,563,455

Reliability improvements as indicated in the previous year's report(s).

As indicated under subsection (b)(3)(A), Sub-part "ii" of Mt. Carmel's "Electric Transmission and Distribution Review for the 2020 reporting period.

Circuit 21000 – (Froman Feeder) In late summer Mt. Carmel plans to complete the rebuild and reconductor of approximately 3,600 ft. of primary overhead facilities in the Lancaster area at an estimated expenditure of $81,000.
Current 2021 Update or Deviation: MCPU completed this project in June of 2021 at an estimated expenditure of $134,238.40.

As indicated under subsection (b)(3)(A), Sub-part "ii" of Mt. Carmel's "Electric Transmission and Distribution Review for the 2017 reporting period.

Transmission Facilities:

In 2019 Mt. Carmel plans to replace the remaining eleven (11) structures in its 138Kv transmission facilities which lie in Edwards County, Illinois at an estimated expenditure of $70,000.00 for that year. In 2020 and 2021 Mt. Carmel plans to replace approximately ten (10) pole structures per year beginning at the Wabash-Edwards County line and working eastward toward MCPU's Keensburg Substation. This equates to approximately forty percent of the total pole structures in this section of line. The total estimated expenditure for these two years is $140,000.00.
2018 Update or Deviation: Mt. Carmel plans to continue this project into the year 2022.
2019 Update or Deviation: Due to a shortened construction season, as indicated above, Mt. Carmel made no progress on this project in 2019. In early January 2020 Mt. Carmel was able to set approximately ten (10) of the eleven (11) structures scheduled for replacement in 2019. Mt. Carmel plans to complete the transfer of these structures as weather conditions allow. There have been no significant changes to the proposed 2020-2021 portions of this project.
2020 Update or Deviation: That portion of this project scheduled to be completed in 2020 has been rescheduled for the fall of 2021 at an estimated expenditure of $188,640 for that year.
Current, 2021 Update or Deviation: In late January 2022 MCPU completed the work Scheduled for the 2020 construction year as identified above. MCPU also replaced nine (9) of the ten (10) structures scheduled for the 2021 construction period. The estimated expenditure for this combined work is work is $105,029.02.

Distribution\Source of Supply:

Mt. Carmel is currently working on constructing approximately 1.09 line miles of 69Kv Source of Supply facilities between its Plant and South Division Substations. This project would allow for the removal of approximately 2.23 line miles of facilities from a known floodplain area along the Wabash River to a more accessible location on the landside of the levee surrounding the southern portion of the City of Mt. Carmel. This project is being undertaken because the existing facilities are nearing their maintenance schedule and have historically been involved in outage events as a result of damage during high water events. Mt. Carmel estimates this project will be completed in 2019 at a total expenditure of $250,000.00.
2018 Update or Deviation: There have been no significant changes to the time line for completion of this project. Mt. Carmel estimates the 2019 expenditure for completion of this project to be $285,500.00.
2019 Update or Deviation: Due to R.O.W. acquisition delays Mt. Carmel has rescheduled this project to begin in the summer of 2020. There has been no change to the estimated expenditure for completion.
2020 Update or Deviation: Mt. Carmel believes that at the end of the 2020 reporting period this project was approximately 50% complete. Mt. Carmel further estimates that the 2020 expenditure for this project is $439,396.79. Mt. Carmel continues to work toward a projected completion date for this project of spring 2021.
Current 2021 Update or Deviation: Mt. Carmel completed this project in early summer of 2021 at an estimated expenditure of $814,944,73.

As indicated under subsection (b)(3)(A), Sub-part "ii" of Mt. Carmel's "Electric Transmission and Distribution Review for the 2016 reporting period.

Circuit #22000 – (Allendale Feeder) In 2018 and 2019 Mt. Carmel plans to upgrade the existing aged URD primary and secondary facilities in both the Northwood and Cherry Hills Subdivisions. This project would replace approx. 1500 total feet of aged direct bury URD facilities in these locations and impact approx. thirty-one total customers. The estimated expenditure for these projects is $109,590.00.
2017 Update or Deviation: Mt. Carmel had originally scheduled these projects to begin in 2018 with an estimated completion date of 2019. After a review of the status of ongoing projects, as defined in this report, and the addition of the Distribution\Source of Supply projects listed as "Proposed Reliability Improvements on page two of this report Mt. Carmel has rescheduled this project for the 2019 thru 2020 reporting periods. Mt. Carmel believes that this rescheduling will allow for the completion of projects involving the Distribution\Source of Supply infrastructure and complete the upgrade of the facilities which are the backbone of Mt. Carmel's supply to its customers.
2018 Update or Deviation: In October of 2018 MCPU completed a portion of this project by replacing approximately 900 feet of aged URD Primary cable in the Northwood Subdivision area as well as replacing two vault type transformers units with pad mount units. Although Mt. Carmel had reported this work would be done in 2019 and 2020, as stated above, delays in other proposed projects caused Mt. Carmel to reevaluate its project work schedule. This portion of the project impacted nine customers at an estimated expenditure of $50,946.12. Mt. Carmel estimates that the Cherry Hills portion of this project will be completed in the fall 2019 at an estimated expenditure of $40,000.00.
2019 Update or Deviation: Mt. Carmel did not complete the Cherry Hills portion of this project as described. A review of this project and the Bona Terra project, outlined below, concluded that due to continued outage concerns as well as unusually high vegetation growth in the heavily wooded Bona Terra area as a result of higher than normal precipitation amounts during the two (2) most recent reporting periods Mt. Carmel has opted to reschedule this project for the 2021 construction season. There has been no modification to the original expenditure for completion.
2020 Update or Deviation: Mt. Carmel has rescheduled this project for the summer of 2022 no updated estimate has been compiled.
Current, 2021 Update or Deviation: Mt. Carmel has reviewed the remaining Cherry Hills portion of this project and the operating history of the facilities involved and determined that these facilities are suitable and will continue to provide reliable service to the customers served into the foreseeable future. MCPU has determined a dedicated focus on its distribution system maintenance program to be more important and a better use of available resources.

In 2019 MT. Carmel proposes to replace approx. 3700 feet of existing OHD primary facilities in the Bona Terra Subdivision with URD facilities. This is a heavily wooded subdivision and access to the existing facilities is limited due to restricted R.O.W. areas. Mt. Carmel estimates that this project would impact approx. 21 customers at an expenditure of $95,145.00
2017 Update or Deviation: Mt. Carmel has made no significant changes to the scope of this project.
2018 Update or Deviation: Mt. Carmel has reviewed the scope of this project and revised it to reflect this review. Currently Mt. Carmel plans to replace only approximately 1,600 ft. of Single Phase OHD conductor with URD facilities. The project completion is scheduled for the summer of 2019 at an estimated expenditure of $100,000.00.
2019 Update or Deviation: Due to unusually wet conditions during the spring of 2019 shortening the construction season and the volume of other work outlined in this section Mt. Carmel has rescheduled this project for the 2020 construction season. There has been no modification to the original expenditure for completion.
2020 Update or Deviation: Mt. Carmel proposes to complete this project in 2021 at an estimated expenditure of $83,583.
Current, 2021 Update or Deviation: MCPU completed this project and put the new URD facilities into service in early November 2021. The estimated expenditure for this project is $199,334.67.

Circuits 11000 – (Circuit #1), Circuit 12000 – (Circuit #2) and Circuit 16000 – (Circuit #6) In 2020 Mt. Carmel plans to begin the reconstruction of approx. 2.57 total line miles of existing aged three phase OHD 4/0 CU conductor with 4/0 Hendrix OHD construction. These facilities represent the trunk lines for Circuits 11000,12000, and 16000 originating at Mt. Carmel's plant substation and terminating at 11th and Mulberry. Combined these facilities serve approx. 775 customers in the residential and business districts in the central and eastern portions of the city of Mt. Carmel. The estimated expenditure for this project is $425,000.
2017 Update or Deviation: Mt. Carmel has made no significant changes to the schedule or budget for project.

2018 Update or Deviation: Mt. Carmel plans to begin this project in the 2020 Plan Year, with a current completion date of 2021, no significant changes have been made to the budget for this project.
2019 Update or Deviation: *Due to delays in other projects and the volume of other work completed, as described in this report, Mt. Carmel plans to begin the engineering phase of this project in the summer of 2020*.
Current, 2020 Update or Deviation: Mt. Carmel continues to engineer the specifics of this project and proposes a completion date by year end 2023.

The following work was not part of the plan submitted in the previous years' report.

Circuit 16000 – (Circuit #6)

Between May and October MCPU completed several facility relocations projects in connection with new construction and expansion of the local hospital facility. MCPU estimates the total expenditure for these projects to be $19,610.08.

Circuit 21000 – (Froman Drive Feeder)

In October MCPU installed facilities to supply service to a customers new construction at 6949 Highway 11. MCPU estimates this project to cost $3,691.15.

Circuit 31000 – (West 3Rd St. Feeder)

In July the existing transformer bank located at a trucking facility in the 1100 Block of West 3rd was relocated to provide better access to the station as well as eliminating potential contact from equipment being moved on the trucking lot. MCPU estimates the cost of this project to be $5,203.15.

Also in July, and in connection to the above project, MCPU relocated approximately 170 Ft. of single phase primary east of the trucking facility to gain better accessibility to these facilities and remove them from the trucking facility property. MCPU estimates the cost of this project to be $14,951.09.

In November MCPU replaced four (4) pole structures as well as updated and reconfigured the secondary facilities in the 800 Block of West 6Th St. MCPU estimates the expenditure for this work to be $21,203.13.

Circuit 32000 – (West 9Th Street Feeder)

In October a pad mount transformer and a portion of the Primary URD facilities servicing a manufacturing facility in the 1000 Block of West 9TH Street was replaced due to failure of both the transformer and URD facilities at this location. MCPU estimates the expenditure for this work to be $10,678.17.
In November MCPU installed URD facilities to supply service to a customers new construction at 1105 Turnberry St. The estimated cost of this addition is $2,207.76.

Circuit 41000 – (Rural West 3Rd Street)

In July MCPU reviewed the phase loading on Line Section F-010S-130W-026-029 near the Sugar Creek Subdivision. As a result of this review MCPU shifted loads on this line section to better balance the circuit loading in the area.

In July the recloser located at the beginning of Line Section 'R-010S-130W-035-004 was replaced and the in service unit was sent out for scheduled factory maintenance. MCPU estimates that the total expense for the maintenance to these unit is $3,430.10.

In September MCPU addressed fifteen (15) defects identified during Staff inspections conducted on this circuit in June of 2021 including two (2) potential NESC clearance violations. MCPU estimates the cost of remediation of these issues to be $6,464.70.

In October MCPU replaced three (3) line poles, a service pole, and a guy anchor assembly in the Wabash 10 Ave area identified during recent circuit inspections. The estimated total expenditure for this work is $8,627.25

Also in October a Line pole was replaced and service facilities were installed to provide service to a customer's new camper site near 17726 Sugar Creek Ave. The estimated expenditure for this installation is $3,074.68.

Circuit 43000 – (Rural West 9Td Feeder)

In June MCPU replaced the transformer bank servicing an oil well location near 9239 N 1550 Blvd due to operator upgrading oil production here. MCPU estimates the expenditure for this work to be $1,112.13

In July approximately 500 Ft of single phase OHD primary and associated facilities was installed to supply service to a customer's new home construction near the village of Friendsville. MCPU estimates that eh cost of this installation was $11,477.20.

In September MCPU installed facilities required to supply service to two new customer service locations in the Friendsville area. MCPU estimates the total expenditure for these additions was $6,385.64.

In September MCPU addressed six (6) defects identified during Staff inspections conducted on this circuit in June of 2021. MCPU estimates the cost of remediation of these issues to be $2,126.30.

Also in September the existing OHD service facilities at 8679 HWY 15 were replaced with URD primary facilities to accommodate the customers new construction at this location. MCPU estimates that the cost of this service replacement to be $8,241.47.

In October approximately 650 ft. of single phase primary facilities were installed to supply service to new construction at 9797 Wabash 17 Ave. MCPU the cost of this installation to be $5, 853.20.

Additionally MCPU replaced six (6) line poles, and one (1) service pole, circuit-wide due to circuit inspection items or other causes. MCPU estimates the total expenditures for these replacement to be $25,661.72.

Subsection (b)(3)(C): The number and duration of planned and unplanned interruptions for the annual reporting period and their impacts on customers.

Note: In its Annual Reliability Review for the 2019 reporting period Mt. Carmel defined its criteria for the isolation of certain distribution facilities located in low lying areas along and near the Wabash River which are known to be impacted during high water conditions.

Between March 3 and March 10, 2021 Mt. Carmel implemented its isolation program on Line Section F-010N-110W-006-015 when river levels were projected to exceed the nineteen (19) Ft. flood stage threshold. This event accounts for 23 customer service interruptions or 1.07% of the total planned interruptions for the reporting period and a total of 224,419 minutes of customer interruption duration, or 58.94% of the total planned interruption duration for the reporting period..

2021 Planned (scheduled) Interruptions and Duration – There were 30 planned interruption events resulting in 2,143 customer service interruptions for a total of 380,763 minutes of customer interruption duration.

2021 Unplanned (unscheduled) Interruptions and Duration – Mt. Carmel calculates that there were 213 unscheduled interruption events resulting in 472,467 total minutes of customer outage duration.

Subsection (b)(3)(D): The number and causes of controllable interruptions for the annual reporting period.

See Supplemental Report.

Subsection (b)(3)(E): Customer service interruptions that were due solely to the actions or inactions of another utility, jurisdictional entity, independent system operator, or alternative retail electric supplier for the annual reporting period.

Mt. Carmel experienced no outages attributed solely to the actions or inactions of another utility, jurisdictional entity, independent system operator, or alternative retail electric supplier during the most recent reporting period.

Subsection (b)(3)(F): A comparison of interruption frequency and duration for customers buying electric energy from the jurisdictional entity versus customers buying electric energy from another utility, or alternative retail electric supplier for the annual reporting period. A jurisdictional entity may base this comparison on each customer's supplier as of December 31 of each year. A jurisdictional entity need not include information on customers whose electric energy supplier is not known to the jurisdictional entity.

No customers were supplied by another entity in 2021.

Subsection (b)(3)(G): A report of the age, current condition, reliability and performance of the jurisdictional entity's existing transmission and distribution facilities, which shall include, without limitation, the data listed below. In analyzing and reporting the age of the jurisdictional entity's plant and equipment the jurisdictional entity may utilize book

depreciation. Statistical estimation and analysis may be used where actual ages and conditions of facilities are not readily available. The use of such techniques shall be disclosed in the report.

i) A qualitative characterization of the condition of the jurisdictional entity's system defining the criteria used in making the qualitative assessment, and explaining why they are appropriate.

Mt. Carmel Public Utility Co.'s transmission facilities have an approximate age of 23 years with an average remaining life of approximately 7 years. The distribution facilities have an approximate average of 15 years with an average remaining life of 15 years. These figures are based on analysis completed 12/31/21 using the total transmission and distribution investment dollars and the life to date depreciation dollars to determine the percentage of remaining life.

The reliability enhancement programs outlined in subsection (b)(3)(A) – iii,vii,viii, as provided in this report, will ensure that the facilities operated by Mt. Carmel Public Utility Co. are inspected and maintained on a regular basis. Based on these actions the Mt. Carmel Public Utility Co.'s reliability indices and the results of the customer satisfaction survey (Attachment "A" to this report) Mt. Carmel believes that the existing Transmission and Distribution facilities are in good operating condition and provide customers with safe and reliable service.

ii) A summary of the jurisdictional entity's interruptions and voltage variances reportable under this part, including the reliability indices for the annual reporting period.

The total number of planned and unplanned outage events for 2021 was 243.

Note: Mt. Carmel experienced three (3) events during the most recent reporting period that resulted in outages occurring at the Substation or Distribution Source of Supply level resulting in a Loss of Supply event. These events are incorporated into Table 6 below and are defined as follows:

At approximately 01:12 on April 02, 2021 a 69KV Source of Supply switch failed causing a Loss of Supply Event to both MCPU's South Division and Plant Substations. This failure resulted in a total of 2,721 customer service interruptions totaling 177,453 minutes of customer outage duration. This event accounts for approximately 29.31% of the total service interruptions and 20.80% of the total customer interruption minutes experienced during the annual reporting period.

MCPU believes that at approximately 10:37 on June 21, 2021 a lightning strike occurred in close proximity to its West Third Street Substation. MCPU believes that this strike caused the 69KV breaker servicing this substation to operate and open causing a loss of supply to the substation. This outage event resulted in a total of 733 customer service interruptions totaling 27,670 minutes of customer outage duration. This event accounts for approximately 7.90% of the total service interruptions and approximately 3.24% of the total customer interruption minutes experienced during the annual reporting period.

At approximately 10:53 on September 21, 2021 a squirrel contacted the bushing on the source breaker for MCPU's Circuit #32000 (West 9Th St. Feeder) originating at the South Division Street Substation location. This contact damaged the circuit breaker and associated switching devices. Additionally as a result of this contact the fused protective device on the source side of the 69\12.5KV transformer located at the South Division Substation site opened resulting in a Loss of Supply event to the remainder of the distribution. This Loss of Supply event resulted in a total of 377 customer service interruptions totaling 19,314 minutes of customer outage duration accounting for approximately 4.06% of the total service interruptions and approximately 2.26% of the total customer interruption minutes experienced during the annual reporting period.

The values identified in *Italic* in Table 6 below represent MCPU's System Reliability Indices excluding the Loss of Supply events listed above.

Table 4: The following table summarizes customer interruptions experienced in 2019 by cause category.

CATEGORY	NUMBER OF EVENTS	PERCENT OF TOTAL EVENTS
Animal Related	26	10.70
Vegetation Related	53	21.81
Employee\Contractor Personnel Errors	0	0
Underground Equipment Related	1	0.41
Transmission Equipment	0	0

Substation Equipment	0	0
Weather	37	15.23
Intentional\Maintenance	30	12.35
Other Alternative Supplier\Utility	0	0
Customer Equipment	35	14.40
Public	7	2.88
Overhead Equipment	27	11.52
Unknown	25	10.29
Other	0	0
Overload	1	0.41

Table 5: The system reliability indices for 2021 are as follows

SAIFI	1.34 \ *0.62*
CAIFI	1.56 \ *1.33*
CAIDI \ Min	66.22 \ *75.13*

iii) The jurisdictional entity's expenditures for transmission construction and maintenance for the annual reporting period expressed in constant 1998 dollars, the ratio of those expenditures to the jurisdictional entity's transmission investment and the average remaining depreciation lives of the entity's transmission facilities, expressed as a percentage of total depreciation lives.

The total depreciated cost of transmission plant in service is $1,992,007 and the average remaining depreciation lives is 23.3%. The 2021 capital expenditure for transmission plant expressed in constant 1998 dollars was $3,442 and maintenance expenditures of $22,587 expressed in constant 1998 dollars for a total of 0.04% of depreciated plant in service and 0.26% of original cost. (No expenses for operations are included in these calculations.)

iv) The jurisdictional entity's expenditures for distribution construction and maintenance for the annual reporting period expressed in constant 1998 dollars, the ratio of those expenditures to the jurisdictional entity's distribution investment and the average remaining depreciation lives of the entity's distribution facilities, expressed as a percentage of the total depreciation lives.

The total depreciated cost of distribution plant in service is $13,149,554 and the average remaining depreciation lives is 49.90%. The 2021 capital expenditure for distribution plant expressed in constant 1998 dollars was $989,847 or 3.76% of the distribution investment. Maintenance expenditures, expressed in constant 1998 dollars, were $724,135 or 2.75% of the distribution investment. These total expenditures represent 13% of depreciated distribution investment and 6.5% of total distribution investment. (No operations expenses are included in these calculations.)

v) The results of a customer satisfaction survey completed during the annual reporting period and covering reliability, customer service, and customer understanding of the jurisdictional entity's services and prices.

This information is provided in Attachment "A" of this report.

vi) An overview pertaining to the number and substance of customers' reliability complaints for the annual reporting period and their distribution over the jurisdictional entity's operating area.

Mt. Carmel Public Utility Co. has received no informal or formal reliability complaints filed by customers of record with the Illinois Commerce Commission in the annual reporting period.

Subsection (b)(3)(H): A table showing the achieved level of each of the three reliability indices of each operating area for the annual reporting period (providing, however, that for any reporting period commencing before April 1, 1998, a jurisdictional entity shall not be required to report the CAIFI reliability index).

Table 6: The system reliability indices for 2021 are as follows

SAIFI	1.34 \ *0.62*
CAIFI	1.56 \ *1.33*
CAIDI \ Min	66.22 \ *75.13*

Note: During 2020 Mt. Carmel's distribution system experienced three outage events which originated at the source of supply or substation level. The indices values identified in italic in Table 7 above represent Mt. Carmel's 2021 reliability indices excluding these events.

Subsection (b)(3)(I): A list showing the worst-performing circuits for each operating area for the annual reporting period with the understanding that the designation of circuits as "worst-performing circuits" shall not, in and of itself, indicate a violation of this part.

Worst-performing Circuit(s) for reporting period – 2021, Mt. Carmel's Circuit #22000 (Allendale Feeder) achieved the highest indices value in the SAIFI category, Circuit #14000 (Circuit #4) achieved the highest value in the CAIFI category and Circuit #15,000 achieved the highest value in the CAIDI category for the most recent reporting period.

Table 7: Worst-performing Circuits, 2021

SAIFI (Outages / Customers Served)	CAIFI (Outages / Customers Impacted)	CAIDI \ Min. (Duration / Outages)
Circuit #22000 – (Allendale Feeder) 1.35	Circuit #14000 – (Circuit #4) 2.00	Circuit #15000 – (Circuit #5) 146.76

Subsection (b)(3)(J): A statement of the operating and maintenance history of circuits designated as worst-performing circuits; a description of any action taken or planned to improve the performance of any such circuit (which shall include information concerning the cost of such action); and a schedule for the completion of any such action. (the jurisdictional entity may decide, based on cost considerations or other factors that it should take no action to improve the performance of one or more circuits designated as worst-performing circuits. If the jurisdictional entity decides to take no action to improve the performance of one or more circuits designated as worst-performing circuits, the jurisdictional entity shall explain its decision in its annual report.

Operating History Circuit #22000 – (Allendale Feeder) Highest SAIFI Circuit. This circuit experienced forty-eight (48) outage events during the reporting period.

Table 8: The following table indicates the number of outages by cause category for this circuit.

CATEGORY	NUMBER OF INTERRUPTIONS	PERCENT OF TOTAL INTERRUPTIONS
Animal Related	2	4.17
Overhead Equipment	6	12.5
Public Contact	1	2.08
Unknown Origin	7	14.58
Vegetation Related	17	35.42
Weather Related	15	31.25

Maintenance History: This circuit is predominantly rural overhead construction and consists of approx. 75.69 line miles of facilities. Mt Carmel estimates the most recent general circuit inspection was completed in February 2021. MCPU further estimates that trimming operations were last completed on this circuit in July 2019, with the next scheduled completion date being between April and June 2022.

Table 9: The following table indicates the maintenance and construction history on this circuit for the reporting period.

DATE:	MAINTENANCE PERFORMED:	LOCATION:	COST (EST):
03/19/2021	Removed Two Unnecessary Phase Conductors	Downstream of Fuse Point, F-010N-120W-028-010	$5,001.90
03/22/2021	Relocated Pad Mount Transformer	14510 N 2360 Blvd	$3,025.86
03/30/2021	Installed Additional TXFMR Station for Expanding Oil Well Operation	N 2250 Blvd	$4,163.77
04/15/2021	Installed TXFMR for new Commercial Location	2710 N Cherry	$3,241.91
06/21/2021	Removed Two Line Reclosers from Service for Scheduled Maintenance	Recloser Points, R-010N-120W-010-002 and R-010S-120W-008-002	$6,860.20
07/20/2021	Replaced Service Pole Due to Third Party Accident	Oil Lease N 2360 Blvd	$1,331.82
08/03/2021	Replaced four (4) Line Poles and Installed a TRANSFMR for New Oil Well Location	Near 23284 E 1300 Rd	$10,256.11
08/25/2021	Installed TRANSFMR for Customers New Construction	11576 N 1560 Blvd	$242.46

10/11/2021	Replaced Two Line Poles and TRANSFMR Unit Due to Damage from Tree Contact Suring Storm	15694 N 2250 Ln	$2,357.37
10/25/2021	Replaced Line Pole and Installed TRANSFMR Station for New Oil Well Location	E 1200 Rd & N 2100 Blvd	$8,203.94
11/16/2021	Relocated TRANSFMR	16590 Wabash 22 Ln	$1,560.07
12/02/2021	Relocated Two TRANSFMR Stations and Reconstructed Secondary Facilities	West Center Section of Cherry Street Estates Due to Accessibility Issues	$29,962.19
12/13/2021	Replaced Line Pole, One Span of Triplex with Primary Conductor, and Installed TRANSFMR Station for Better Service to the River Camp Locations	Near the End of LS F-010N-120W-028-011	$4,190.00

Actions Planned or Taken To Improve Reliability:

- Actions Planned: See Items identified under Subsection (b)(3)(A) above for Circuit #22000.

- Actions Taken: See items in Table 9 above, also see items listed under Subsection (b)(3)(B) above.

Operating History Circuit #14000 – (Circuit #4) Highest CAIFI Circuit. This circuit experienced eight (8) outage events during the reporting period.

Table 10: The following table indicates the number of outages by cause category for this circuit.

CATEGORY	NUMBER OF INTERRUPTIONS	PERCENT OF TOTAL INTERRUPTIONS
Animal Related	1	14.29
Overhead Equipment	2	28.57
Unknown Origin	1	14.29
Vegetation Related	2	28.57
Weather Related	1	14.29

Maintenance History: This circuit is predominantly urban overhead and consists of approx. 3.84 line miles of facilities. Mt Carmel estimates the most recent circuit inspection was completed in November 2021. MCPU further estimates that trimming operations were last completed between January and March 2020, with the next scheduled completion date being between January and March 2023.

Table 11: The following table indicates the maintenance and construction history on this circuit for the reporting period.

DATE:	MAINTENANCE PERFORMED:	LOCATION:	COST (EST):
01/29/2021	Resolved Minor Issues Identified During 2020 Circuit Inspection	Various Locations	$2,855.38
02/23/2021	Replaced Three Line Poles and Service Pole	700 Block of Chestnut	$13,085.49
03/01/2021	Replaced Line Pole Due to Third Party Accident	809 N Walnut	$9,465.01

Actions Planned or Taken To Improve Reliability:

- Actions Planned: Mt. Carmel has no large scale actions planned for this circuit. Based on the operating history provided in Table 11 above, Mt. Carmel believes that the best short-term action is to continue routine tree trimming and inspection schedules on this circuit in an effort to identify possible reliability concerns.

- Actions Taken: See items listed in Table 11 Above.

Operating History Circuit #15000 – (Circuit #5) Highest CAIDI Circuit. This circuit experienced nine (9) outage events during the reporting period.

Table 12: The following table indicates the number of outages by cause category for this circuit.

CATEGORY	NUMBER OF INTERRUPTIONS	PERCENT OF TOTAL INTERRUPTIONS
Animal Related	2	22.22
Overhead Equipment	1	11.11
Public Contact	2	22.22

Unknown Origin	2	22.22
Vegetation Related	2	22.22

Maintenance History: This circuit is predominantly urban overhead and consists of approx. 4.01 line miles of facilities. Mt Carmel estimates the most recent circuit inspection was completed in November 2021. MCPU further estimates that trimming operations were last completed between January and March 2020, with the next scheduled completion date being between January and March 2023.

Table 13: The following table indicates the maintenance and construction history on this circuit for the reporting period.

DATE:	MAINTENANCE PERFORMED:	LOCATION:	COST (EST):
03/12/2021	Replaced Three Line Poles Identified During 2020 Circuit Inspection	Near 105 Pecan Ave	$7,645.17
03/18/2021	Replaced Transfmr. Pole Identified During 2020 Circuit Inspection	Near City Levee Pump	$3,892.66
07/27/2021	Replace Customer Service to Eliminate Potential Clearance Violation	611 W 4Th	$2,190.01
08/15/2021	Replaced Six Line Poles Due to Third Party Contact	100 Block of North Walnut	$21,583.21
10/25/2021	Replaced Two Line Poles Identified During 2020 Circuit Inspection	100 Block of Elm Street	$5,892.58

Actions Planned or Taken To Improve Reliability:

● Actions Planned: Mt. Carmel has no large scale actions planned for this circuit. Based on the operating history provided in Table 12 above, Mt. Carmel believes that the best short-term action is to continue routine tree trimming and inspection schedules on this circuit in an effort to identify possible reliability concerns.

● Actions Taken: In 2019 MCPU began to finalize plans to relocate an existing 69Kv line out of a known flood plane area to the land side of a levee surrounding the southern portion of the City of Mt. Carmel. As part of this project that portion of Circuit #15000 (Circuit #5) which is constructed as under build facilities on the existing 69KV pole structures will also be relocated as well as extending the current line section to a point where it will meet Circuit #31000 at Mt. Carmel's South Division Substation. Mt. Carmel completed this project in mid 2021 at a three year estimated total of $313,259.57 for that portion of this project involving Circuit #15000.

Also see items listed in Table 13 Above.

Subsection (b)(3)(K): Commencing June 10, 2001, tables or graphical representations, covering for the last three years all of the jurisdictional entity's customers and showing, in ascending order, the total number of customers which experienced a set number of interruptions during the year (i.e., the number of customers who experienced zero interruptions, the number of customers who experienced one interruption. etc.)

Table 12:

Number of Outages Experienced	Number of Customers		
	2019	2020	2021 – Annual Reporting Period
0	1,111	1,535	660
1	1,484	904	2,132
2	864	1,837	1,148
3	421	319	1,160
4	673	354	233
5	482	317	83
6	253	54	3
7	80	77	2
8	60	22	
9	19	4	
10	21	8	
11	5	4	
12	1	1	
13	-0-	2	

14	-0-	4	
15	-0-	9	
16	-0-	1	

Subsection (b)(3)(L): Commencing June 10, 2001, for those customers who experienced interruptions in excess of the service reliability targets. A list of every customer, identified by a unique number assigned by the jurisdictional entity and not the customers name or account number, the number of interruptions and interruption duration experienced in each of the three preceding years, and the number of consecutive years in which the customer has experienced interruptions in excess of the service reliability targets.

See Supplemental Report

Subsection (b)(3)(M): The name, address and telephone number of the jurisdictional entity representative who can be contacted for additional information regarding the annual report.

David W. James II
President/COO
Mt. Carmel Public Utility Co.
316 Market Street
Mt. Carmel, Illinois 62863
Phone: (618)-262-5151
Fax: (618)-262-4798
Email: djames@mtcpu.com

MT. CARMEL PUBLIC UTILITY CO.

ELECTRIC TRANSMISSION AND DISTRIBUTION REVIEW

ATTACHMENT "A"

CUSTOMER SATISFACTION SURVEY

MT. CARMEL PUBLIC UTILITY CO.